



21st Century Military Nutrition: Considerations & Approaches

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Overview

- ◆ Problem / Military Requirement
- ◆ Considerations for Developing Effective Approaches
- ◆ Concept to optimize Warrior Nutrition
- ◆ Prototype Research
- ◆ Conclusions





REQUIRED JFHP CAPABILITY: ***Provide a Healthy and Fit Force***

The ability to provide and enhance a healthy and fit force throughout the continuum *from accession to veteran* includes:

- ◆optimizing health/fitness of peacetime forces
- ◆maintaining health/fitness of deployed forces
- ◆Ensuring physical and mental health [reset] of redeployed SMs

Joint Force Health Protection Concept of Operations

v 0.9, July 07

Developed by OSD (Health Affairs)

Enabler:

Nutrition programs to promote eating behavior by Warriors that establish and maintain a health & fitness over a lifetime





**Nutrition
Science For
Force Health
Protection**

USARIEM Military Nutrition Research Program

Nutritional Optimization of

Health & Performance

- macro/micro-nutrient
rqmts
- supplements & bioactive
foods
- meal timing, feeding
plans, menus, nutrient
delivery systems

Operational Ration Testing & Evaluation

- nutrient composition
- physiological
- cognitive
- sensory

Healthy Weight Management

- risk factors & behavior
- interventions





Feeding the Force in the "Real World"

Public /
Private Dining

Garrison Dining

Group
Rations

Operational
Rations

Individual
Rations

Unconstrained

Constrained



Meal, Ready to Eat
Meal, Cold



Weather
LRP



UGR-B: Canned & Dehydrated Foods
UGR-H&S: Heat and serve ration
UGR-A: Heat & Serve+ Fresh,
Perishable foods





US Armed Forces - a Large, Diverse Population

One Size Doesn't Fit All!



**Total Armed
Services**

1,417,157

Army

525,482

Navy

331,383

Marine Corps

190,651

Air Force

327,589

DoD Total

1,375,105

Coast Guard

42,052





It's not nutrition until it's eaten"

COL Dave Schnakenberg

◆ Nutrient Factors

- Macronutrients
- Micronutrients
- Bioactive Components

◆ Non-Nutrient Factors

- Food associated
- Individual associated
- Environmental

Nutritional Value

Food Preferences & Consumption

Dietary Quality

***Health Is not often the
chief motive for young
men to change eating
behavior -***

***(vigor, appearance
performance)***

Meiselman & MacFie, 1996





Factors Determining Food Consumption

Closely linked



◆ Food

- Portion size
- Acceptances, Liking, Preferences*
- Perceptions (appearance, labels, packaging, origins)
- Presentation (temperature, utensils, dishes)
- Variety, monotony, sensory specific satiety

◆ Individual

- Age, sex, cultural influences
- Expectations* (marketing, education influence)
- Attitudes (neophobia, involvement, dietary restraint)
- Commensality (non-obese vs. obese)
- Food and Mood/Emotion

◆ Environment

- Location
- Time of Day (meal appropriateness, snacks, presentation)
- Choice
- Ambiance (comfort)
- Convenience & access (effort, time)
- Price, value





Promoting Healthy Eating Behavior - Civilian Cafeteria Research

◆ Nutrient Content Manipulation of ad lib diet (minimal effect?)

- Jayhawk Observed Eating Trial (Donnelly et al., Obesity. 2008)
 - ✗ In 305 sedentary normal & overweight men & women, reduced fat diets only effective in weight loss when energy intake was reduced

◆ Ad lib food choice can be manipulated (for the better?)

- Harvard SPH Cafeteria Study (Michels, et al., J Am Coll Nutr. 2008)
 - ✗ Educational displays
 - ✗ Price subsidies for “healthy” selections
- NIH-funded Cafeteria Study (Lowe, et. al., unpublished ongoing project)
 - ✗ Detailed food labeling
 - ✗ Greater number “healthy” selections
 - ✗ Price subsidies for reduced energy density items
- Yale NSLP Study (Schwartz, Int. J. Behav. Nutr. Phys. Act. 2007)
 - ✗ Verbal prompts by food servers to encourage fruit selection
- “Sargent Choice” at Boston University – anecdotal reports
 - ✗ Logo label of line of “healthy” food choices throughout DFACs

Why are french fries & hotdogs cheaper than salad?





Promoting Healthy Eating Behavior- The 21st Century Warrior Nutrition Center Concept

◆ Evolve garrison DFACs into state-of-art centers *Its not just slinging hash*

- Military Dietitian Directed
- Provide and/or promote consumption of the most healthy diet tailored for Warriors, their families and the garrison community.
- Apply best practices in nutrition science, nutrition education, nutrition therapy, counseling and intervention.
- Holistic community/environmental support for changing behavior to optimize health/fitness.
- Supports needs and goals of garrison MTFs, units, schools, and community.





Promoting Healthy Eating Behaviors

The 21st Century Warrior Nutrition Center

Cafeteria Intervention

- nutritional content
- promote/optimize healthy food choice

Education / Resources

support for Warriors, their family & entire garrison community

Evolve DFACs

“focal point” for nutrition care, education & health promotion at each base





Modifying Serving Practices in Military DFACs to Enhance Healthy Nutrition

◆ 10 DFACs that serve 300 Warriors per meal

- Cluster (group) randomized controlled trials, partial cross-over
 - ✗ Intervention (n=5) - month 1-12
 - ✗ Control (n=5) - no change month 1-6, "Fresh Start" month 7-12

◆ Intervention

- Dietary Guidelines for Americans 2005 (fresh fruits, vegetables, whole-grains, fiber, reduced fat/sugar content alternatives, lean cooking methods).
- Presentation, placement changes in food service
- Nutrition labeling and education materials posted

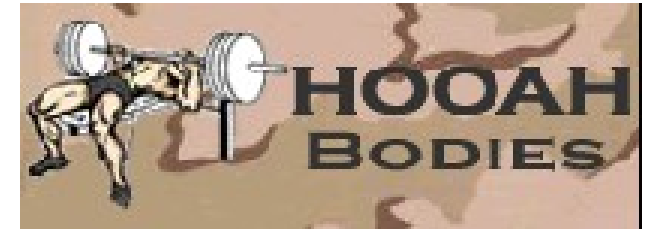
◆ Measurements

- **Ad lib** food selections & intake, demographics & satisfaction ratings
- Lunch (225 volunteers) at months 0 (baseline), 6 & 12.
- Digital photography quantitative & qualitative nutritional assessment of food selected and consumed.
- Outcomes
 - ✗ Primary - % kilocalories intake from fat
 - ✗ Secondary - % carbohydrate and protein intake, food selection, fruit & vegetable servings, total kilocalories food intake.





21st Century Research Challenge





Questions?

21st Century Warrior Nutrition programs to establish and maintain optimal fitness are likely to be most effective by promoting long-term change in Warrior eating behavior within a holistic, environmental approach consistent with healthy lifestyle.

Evolving current garrison DFACs into state-of-the-art nutrition centers, under direction of military dietitians offer a means of integrating nutrition science, medical care, fitness training and wellness promotion throughout the Warrior community.

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